

S/N: 09/362,924
Page 5 of 9

REMARKS

Claims 1, 4-7, 9-15, 17-19, 24, 26, 27, 29-36, 39-42, 44-49 and 51-54, are pending in the application. Of these, claims 19, 41 and 51 are being amended and claims 55-57 are being added. Claims 44-46 are being cancelled. Applicant requests entry of these amendments and they are fully supported by the specification and original claims and add no new matter.

Allowed Claims

Applicants appreciate the Examiner's indication of allowance of claims 1, 4-7, 9-15, 17-18, 27, 29-36, 39-40 and 46-49.

Rejection Under 35 U.S.C. 102(a) of Claims 41-42 and 44-45

The Examiner rejected claims 41-42 and 44-45 under 35 U.S.C. 102(a) as being anticipated by U.S. Patent No. 5,865,896 to Nowak et al. This rejection is respectfully traversed.

Claim 41, as amended, is not anticipated by Nowak et al because Nowak et al does not teach "providing an energized first process gas in the chamber to clean the surfaces in the chamber, the first process gas consisting essentially of oxygen," as recited in the claim. Nowak et al teaches a chamber clean operation with "a fluorine-containing gas (e.g., NF₃, CF₄, C₂F₆, etc.) and oxygen" (column 7, lines 23-24.) Thus, Nowak et al teaches a gas comprising oxygen and a fluorine-containing gas, and does not teach a gas consisting essentially of oxygen. Accordingly, claim 41 and the claims depending therefrom are not anticipated by Nowak et al.

S:\CLIENT\APPLIED\CLCH\1945.P2\AMEND004.doc

S/N: 09/362,924
Page 6 of 9

Rejection Under 35 U.S.C. 103(b) of Claims 19, 24, 26 and 51-54

The Examiner rejected claims 19, 24, 26 and 51-54 under 35 U.S.C. 103(a) as being unpatentable over by U.S. Patent No. 6,159,811 to Shin et al in view of U.S. Patent No. 5,891,799 to Tsui et al. This rejection is traversed.

Claim 19, as amended, is patentable over Shin et al in view of Tsui et al because neither of these references teach or suggest "providing a cleaning gas comprising an oxygen containing gas in the chamber and coupling RF power to energize the cleaning gas to clean the first and second etchant residue deposits formed on the surfaces in the chamber and simultaneously remove residual charge accumulated in the substrate," as recited in the claim. Instead, Shin et al teaches overetching a polysilicon layer with an "etching gas mixture including $21\text{Cl}_2/9\text{O}_2$ " (column 7, lines 61-62.) Shin et al does not teach or suggest that the overetch gas cleans while simultaneously removing residual charge accumulated in the substrate. Tsui et al teaches patterning a hard mask layer (column 5, lines 53-54), but does not teach or suggest providing a cleaning gas to clean and simultaneously remove residual charge accumulated in the substrate, and thus does not make up for the deficiencies of Shin et al. Accordingly, claim 19 and the claims depending therefrom are patentable over Shin et al in view of Tsui et al.

Similarly, claim 51, as amended, is patentable over Shin et al in view of Tsui et al because neither of the references teach or suggest "providing an energized cleaning gas to at least partially remove residues formed on surfaces in the ... and simultaneously remove residual charge accumulated in the substrate," as recited in the claim. Instead, as discussed above, Shin et al teaches an overetch with Cl_2 and O_2 , and Tsui teaches patterning a hard mask, but neither of the references teach or suggest

S:\CLIENT\APPLIED\CLCH\1945.P2\AMFND004.doc

S/N: 09/362,924
Page 7 of 9

providing a gas to clean while simultaneously removing residual charge accumulated in the substrate. Accordingly claim 51 and the claims depending therefrom are patentable over Shin et al in view of Teui et al.

CONCLUSION

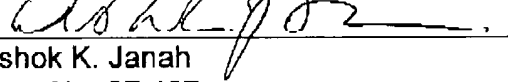
The pending claims are allowable at least for the reasons given above. The Examiner is respectfully requested to reconsider the present rejections and allow the pending claims. Should the Examiner have any questions, the Examiner is respectfully requested to telephone Applicant's representative at the number listed below.

Respectfully submitted,

JANAH & ASSOCIATES

A PROFESSIONAL CORPORATION

Dated: 1/3/03

By: 
Ashok K. Janah
Reg. No. 37,487
Phone no: (415) 538-1555

Please continue to send correspondence to:

Patent Counsel
APPLIED MATERIALS, INC.
P.O. Box 450A
Santa Clara, California 95052

S:\CLIENT\APPLIED\CLCH\1945.P2\AMEND004.doc

S/N: 09/362,924
Page 8 of 9**MARKED-UP COPY OF AMENDED CLAIMS FOR S/N 09/362,924**

19. (amended three times) A method of etching a substrate in a chamber and cleaning etchant residue from surfaces in the chamber, the method comprising the steps of:

- (a) electrostatically holding [placing] the substrate in the chamber;
- (b) providing an energized first gas in the chamber, the energized first gas being capable of etching a first material on the substrate thereby depositing a first etchant residue on the surfaces in the chamber;
- (c) after (b), providing an energized second gas comprising a fluorinated cleaning gas in the chamber, the energized second gas being capable of etching a second material on the substrate while suppressing deposition of a second etchant residue onto the first etchant residue, the first etchant residue being compositionally different from the second etchant residue; and
- (d) after (c), providing a cleaning gas comprising an oxygen containing gas in the chamber and coupling RF power to energize the cleaning gas to clean the first and second etchant residue deposits formed on the surfaces in the chamber and simultaneously remove residual charge accumulated in the substrate.

41. (amended three times) A method of cleaning a chamber to remove residue from surfaces of a ceiling portion in the chamber, the chamber having an antenna adjacent to the ceiling portion, and the method comprising the steps of:

- (a) providing an energized first process gas in the chamber to clean the surfaces in the chamber, the first process gas consisting essentially of oxygen; and
- (b) setting a chamber source power level applied to the antenna to remove residue from the surfaces of the ceiling portion.

S:\CLIENT\APPLIED\CLCH\1945.P2\AMEND004.doc

S/N: 09/362,924

Page 9 of 9

51. (amended three times) A method of etching a substrate in a chamber and at least partially removing etchant residue from surfaces in the chamber, the method comprising:

- (a) [supporting] electrostatically holding the substrate in the chamber, the substrate having a first and a second layer thereon, the second layer comprising a metal silicide layer;
- (b) providing a first energized gas in the chamber to etch the first layer;
- (c) providing a second energized gas in the chamber to etch the second layer and at least partially remove the etchant residue formed on the surfaces in the chamber in (b); and
- (d) providing an energized cleaning gas to at least partially remove residues formed on surfaces in the chamber in (b) and (c) and simultaneously remove residual charge accumulated in the substrate.

S:\CLIENT\APPLIED\CLCH\1945.P2\AMEND004.doc